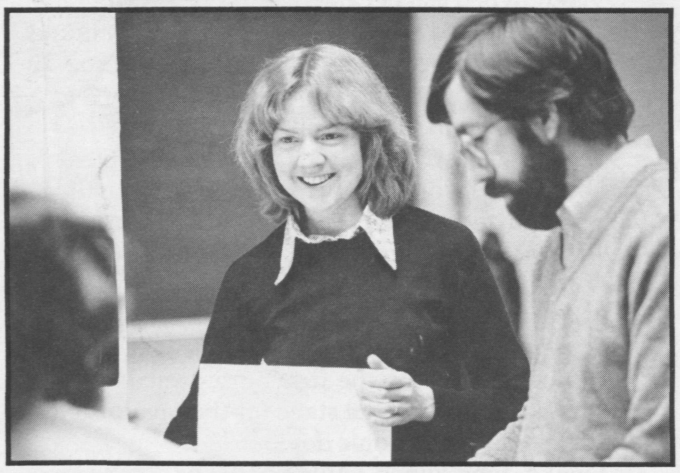
Cornell Chemistry

The Newsletter of the Department of Chemistry and the Society of Cornell Chemists

October 1988 Issue 42



BARBARA A. BAIRD
Biophysical & Physical Chemistry

In 1980, after completing a Damon Runyon–Walter Winchell Postdoctoral Fellowship with Pierre Henkart at the National Institutes of Health, Professor Baird returned to Cornell, where she had earlier studied with Gordon G. Hammes. In 1987 she received the Harold Lamport Award for Young Investigators in Biophysics or Physiology from the New York Academy of Sciences.

Our laboratory is interested in molecular aspects of cell membrane receptor proteins that are important in the transmission of signals during immunological responses. Currently the principal subject of our research is the cell surface receptor for immunoglobulin E (IgE). That receptor, which is located on the surface of mast cells and basophils, binds IgE with high affinity to mediate the release of histamine from intracellular granules during the allergic response. The critical event in this process is the aggregation of a few receptor molecules, which is initiated *in vivo* by the molecular bridging of receptor-bound IgE with multivalent antigen.

The biochemical events that immediately follow receptor aggregation have not been elucidated but probably involve an alteration in the interaction of the receptor with other cellular components. Monoclonal IgE, together with cellular preparations at different levels of complexity—including whole cells, plasma membrane vesicles, and solubilized, purified IgE-receptor complexes—are being employed to investigate molecular details of the important structure-function relationships in the system. Techniques of chemical modification with radioactive and spectroscopic probes are being incorporated to identify and characterize important sites contained in the interacting components. The kinetics and thermodynamics of binding and cross-linking reactions between cell-bound IgE and defined multivalent antigens are being characterized with fluorescence and radioactivity assays, together with theoretical models.

We have used fluorescence resonance energy transfer to map the three-dimensional structure of receptor-bound IgE, and those studies are being extended to investigate the conformation and arrangement of receptor complexes before and after cell triggering. Our recent fluorescence photobleaching recovery measurements have indicated that receptors clustered in a triggering configuration become anchored to the cytoskeleton, and that represents a link between the outside and the inside of the cell. Chemical cross-linking reagents are being used to determine the specific molecular interactions.

Our research efforts directed toward elucidating immunological receptor mechanisms have recently extended to the antigen-specific receptors on T-cells. These cells and receptors arise in response to foreign antigens and provide the means by which T-cells recognize and kill the target cells bearing the foreign antigens, or stimulate other immunological responses to fend off the invasion. In this manner virally infected cells are destroyed and transplanted tissue is rejected. Fluorescence methods that have been worked out for investigating structure and function of the IgE receptor are being applied to the T-cell receptor, and new techniques are also being developed to handle the increased complexity of the T-cell system.

Professor Albert W. Laubengayer: a Remembrance

by Martin B. Stiles, Cornell News Service

Emeritus Professor **Albert W. Laubengayer**, a member of the chemistry faculty from 1928 until his retirement in 1966, died June 15 at his home on Berkshire Road. He was 89.

A renowned teacher and researcher, he was affectionately referred to as "Lauby" by his students and friends. His career at Cornell spanned some 70 years, starting with his matriculation in 1917 as a freshman student in chemistry.

By 1939, according to the late Michael J. Sienko, Lauby was the world's expert on boron and a nationally recognized teacher. Sienko recalled that when he first met Laubengayer as a freshman student in 1939, "I did not know it at the time, but I was in the presence of the world's expert on boron chemistry, only steps away from the high-ceilinged old lab where he had grown the first pure crystals of elemental boron and set the stage for the revolution in electronics and electronic devices."

Sienko, who joined Laubengayer as a colleague on the chemistry faculty in 1947, also recalled that in the 1930's "Lauby took over the advanced inorganic course, with the stimulation of a string of famous visitors as Baker Lecturers (Pauling, Hahn, Sedgwick, Debye) Lauby developed the course into the finest and most modern inorganic chemistry course in the country."

Laubengayer was the author of the textbook "General Chemistry" and "Laboratory Manual and Problems in Introductory Chemistry", and for years gave a rigorous freshman course in chemistry scheduled at the unpopular hour of 8 a.m.

Sienko wrote in a 1981 Chemistry Newsletter that "Lauby was a superb teacher", who by nine o'clock "had done a full day's work, delighting us with his vast knowledge of the elements, obviously relishing each experiment he demonstrated to get his points across. At eleven o'clock he was lecturing again, this time to the graduate students. Monday, Wednesday, and Friday were heroic days for Lauby, filled with teaching, direction of the freshman chemistry program, heavy department responsibilities, and a major commitment to chemistry research."

Since 1967, the Department of Chemistry has awared annual Laubengayer Prizes to three outstanding students in introductory chemistry in honor of Laubengayer's "interest in undergraduate students and extensive activity in undergraduate instruction."

He also had trained over 90 graduate students by the time of his retirement and was the author of about 80 articles and reviews in inorganic chemistry.

In 1950, following his earlier work on boron, Laubengayer revealed that collaborative work with a General Electric Co. scientist showed that a chemical union of boron and certain organic substances could produce new plastics, lubricants and waterproofing substances.

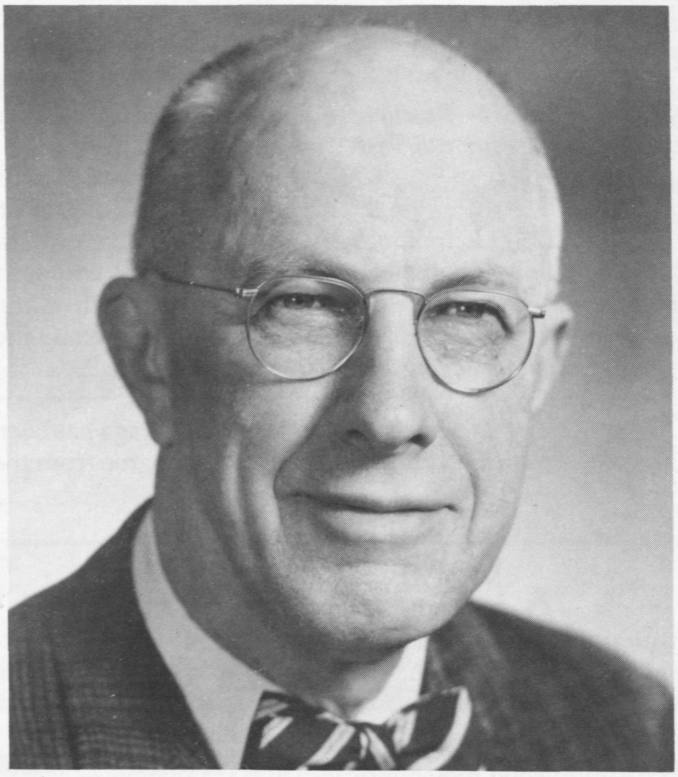
But in the words of Sienko, "Besides boron, square dancing and ice-skating, one of Lauby's greatest passions has been wine making. For years he has been Ithaca's master vintner and during Prohibition was Cornell's most popular professor as the Ithaca elite sought him out for counsel on how to correct their fermentation problems."

In 1967 Lauby helped found the American Wine Society, with a membership that now numbers in the thousands.

In one of several articles on his recollections of his career at Cornell, Laubengayer wrote that Walk Sheppard B. Chem '32, blames this one on me. On a test in freshman chemistry the students were asked the ancient stock question, how is sodium bicarbonate made? One student had no idea but though it amusing to reply, 'God made all things, even sodium bicarbonate.' I was credited with writing in red pencil over his answer, 'God gets credit, You don't.' I am not adverse to taking credit for this, but I think the story is one that has gone the rounds for many years in various forms and has been told with glee about many teachers."

Laubengayer was born in Saline County, Kan., and earned a bachelor's degree in chemistry in 1921 and doctorate in chemistry in 1926 at Cornell.

Survivors include his daughters, Susan L. Cowing of Binghamton and Nancy L. Smothergill of Syracuse, and five grandchildren.



Albert Washington Laubengayer

1899 - 1988

Faculty News

New Grants

Jon C. Clardy, $9,000, Chevron Res - *X-Ray Crystallographic Studies of Biological Marker Compounds;* $169,000, DHHS/NIH-DRR - *X-Ray Diffraction Instrumentation*

Francis J. DiSalvo, $192,274, DOD/Navy-ONR - *Synthesis of Novel Conducting Solids*

Bruce Ganem, $40,000, ACS-PRF - *Studies on the Mechanism and Inhibition of Cellulase*

Paul L. Houston, $148,891, DOD/Army-ARO - *Reactions of Hydrogen Atoms Important to the Decomposition of Energetic Materials*

Atsuo Kuki, $100,866, DHHS/NIH-NIGMS - *Electronically Active AIB Helices;* $72,000, NSF - *Path Integral Studies of Electron and Hole Tunneling in Proteins*

George H. Morrison, $114,000, NSF - *Chemical Imaging with the Stigmatic Microscope*

John R. Wiesenfeld, $238,000, NSF - *Facility for Laser Spectroscopy Upgrade*

Awards and Nominations

Tadhg Begley has been named the first recipient of a new faculty development grant of $20,000 established by Merck Sharp and Dohme Research Laboratory.

Jon Clardy has received the 1987 ACS Akron Section Award for his extensive and innovative work on the use of x-rays for determining the structures of organic molecules.

Franklin Long received a certificate marking 50 years of membership in the American Chemical Society.

Jerrold Meinwald and **Pete Wolczanski** have been awarded grants from the President's Fund for Educational Initiatives. Meinwald will develop an introductory chemistry course for non-majors to be titled Molecular Messengers in Nature. Wolczanski will modernize and diversify the freshman chemistry laboratory program.

Harold Scheraga has been awarded an honorary Doctor of Science degree from the University of Rochester.

Alumni News

Morton Antler, PhD '53, a distinguished member of the AT & T Bell Labs Technical Staff, was elected a Fellow of the Institute of Electrical and Electronics Engineers (1986) and of the American Society for Testing and Materials (1988) and was also a recipient of the Scientific Achievement Award of the American Electroplaters and Surface Finishers Society (1987). He is also the Chairman of the IEEE Committee and is responsible for its conferences, publications, standards, educational and scholarship activities in the field of electric contacts.

A. William Johnson, PhD '57 writes: "I have served as Dean of the Graduate School at the University of North Dakota since July 1, 1967 and am stepping down from that position as of July 31, 1988. I am returning to the Chemistry Department where I will be Professor of Chemistry effective August 1, 1988. Further, for the 1988-89 year I will be on sabbatical leave and will spend the period January through May as Visiting Professor of Chemistry at the University of Massachusetts, Amherst."

Lost Alumni

Any information on the following lost alumni would be greatly appreciated:

Adriano, Felipe
Benzon, Melvyn
Bonnucci, Michael
Bruno, G.
Bueche, Margaret
Buhrer, James
Cannarsa, Michael
Cha, Chul-Yung
Chalupski, Victor
Cogger, Craig
Dahlberg, Donald
Dalzell, Haldean
Epand, Raquel
Forre, Alan
Gaal, William
Gedell, Ragnar
Jacobs, Simone
Jenkins, Myrna
Kagan, Mark
Konechny, Jan
Leung, C.S.T.
Mesirov, Michael
Miller, Jim
Mohamadi, Fariborz
Parr, Deborah
Ratenberg, Don
Sawada, Hideo
Scherr, Charles
Seager, Margaret
Sexton, Margaret
Sha, Chin-Kang
Wilkens, James

Student News

PhD Recipients

August 1987

Adams, Thomas E.
Cabrera Martinez, Carlos R.
Guadalupe, Ana R.
Martens, Craig C.
Rossen, Kai
Swenson, Rolf E.
Vasquez, Maximiliano J.

January 1988

Eis, Michael Johannes
Ferguson, Gregory S.
Guneratne, Ranil D.
Loo, Joseph A.
Mariani, Robert D.
Trolier, Michael R.
Tyler, Stephen J.
Van Duyne, Gregory D.
Wheeler, Ralph A.
Yuan, Zhengyu

May 1988

Erickson, Jon W.
Leckband, Deborah E.
Newman-Evans, Richard H.

Commencement 1988

Fifty students received their Bachelor's Degrees on Sunday, May 29, 1988. After a ceremony at Schoellkopf Field, the seniors returned to the lobby of Baker Lab for a brief reception. Diplomas were handed out by the chairman, John Wiesenfeld. Graduating *summa cum laude* were **Jeffrey W. Elam, Mitsuko Fujiwara,** and **Helen Lu**; *magna cum laude* **Amy Elizabeth Brice, Sunfa Cheng, Anne-Lise Mogstad,** and **Randall Warren Viola**; and *cum laude* **Pang-Chieh Eu, Sreedhar Gaddipati, Frank Kvietok, Richard Ira Michelman** and **Marcia F. Sellos-Moura.**

Graduate Awards

Matthew Kubasik (*Kuki*), **Jonathan Mumford-Zisk,** (*Begley*), **Georgias Papandreou** (*Clardy*), **Kathryn Uhrich,** (*Collum*), **and Ray Wieboldt** (*Hammes*), DuPont Teaching Award for outstanding teaching assistants

Larry Fried (*Ezra*), **Jeffrey Gorcester** (*Freed*), **Evan Williams,** (*McLafferty*) and **Marja Zonnevylle** (*Hoffmann*), Tunis Wentink Prize for outstanding graduate students

Jing Li (*Hoffmann*), Howard Neal Wachter Prize for outstanding third year physical chemistry graduate student

Evan Williams (*McLafferty*), Graduate Award in Applied Spectroscopy from the New York Section Society for Applied Spectroscopy

Undergraduate Awards

Bradley Oldick, Allen Berger and **Stephen Pappas,** Albert W. Laubengayer Prize. *Awarded to the best students in Freshman Chemistry (103, 207 and 215).*

Jeff Elam and **Mitsuko Fujiwara,** George C. Caldwell Prize. *Awarded to two senior chemistry majors who have shown general excellence.*

David Lewis Cherry, Harold Adlard Lovenberg Prize. *Awarded to a member of the junior class with a major in chemistry who has shown general excellence.*

Sydney Eileen Morss and **Ken D. Shimizu,** CRC Press Chemistry Achievement Award. *Awarded for excellence in Sophomore Chemistry.*

Jennifer Colonell, ACS Analytical Chemistry Award. *Awarded to a student who has completed the third year of undergraduate study and displays an interest in and aptitude for a career in analytical chemistry.*

Helen Lu, American Institute of Chemists Award. *Awarded to the outstanding graduating senior who has a demonstrated record of leadership, ability, character, and scholastic achievement.*

Elizabeth Borgoy and **Gregg Caporaso,** Merck Index Award. *Awarded to outstanding students of the senior class majoring in chemistry.*

Gregg Caporaso, Presidential Scholar for 1988.

Coming Events

Messenger Lectures

The Department of Chemistry will host the 1988 Messenger Lecture Series in October, 1988. Professor **Bert L. Vallee**, of the Center for Biochemical and Biophysical Sciences and Medicine at Harvard Medical School, will deliver three lectures on "How Zinc Affects Biology and Medicine and the Fundamentals of Our Lives". The lectures will be held in Baker 200 on October 10, 12 and 14 at 4:30 pm.

Baker Lectures

The 1988 George Fisher Baker Lectures will be given by Professor **Jeremy Knowles**, from the Department of Chemistry at Harvard University. The lectures, entitled "Enzymes: Stereochemistry and Mechanism", will take place on Tuesdays and Thursdays at 11:15 am in Baker 200 beginning on Thursday, October 20 and continuing through Thursday, December 8.

Mobay and Debye Lectures

Dotsevi Sogah, from Du Pont Central Research, will deliver the Mobay Lectures on April 24, 25, and 26. Title to be announced in an upcoming isssue of *Cornell Chemistry*. Also in April (dates and title to be announced) **Jack E. Baldwin** of the Imperial College, University of London will give the Debye Lecture Series, sponsored by the American Chemical Society.

Chairman's Column

The last issue of Cornell Chemistry announced John Wiesenfeld's decision to move to Day Hall and shared his plans for the future. Now, as John and Kathy enjoy a six month leave in Seattle, I have begun to serve as the department's chair. On behalf of the department, I'd like to thank John for his foresight, diplomacy, and organizational skills in the past three years. He left the department in excellent shape - well organized, fiscally sound, and confident. We look forward to his return to Cornell in January and to a reduction in our long distance phone bills.

Part of the initiation rite for a new chair is a series of discussions with the Dean on difficulties and opportunities facing the department. We confront a number of problems, and I'll address some of them in future issues, but I'd like to mention now about some of the good news in research and teaching. Last year the department brought in more research money than ever before. In these days of level federal research budgets, increases are a significant achievement. The Cornell Chemistry department's increase was a spectacular 25% to over $9 million. Many people contributed to the funding effort and we are proud of their accomplishments.

As part of our curriculum revitalization, we have inaugurated a new course for freshman engineers. Chemistry for the Applied Sciences, Chemistry 211, is a one semester introductory course that emphasized solids and employs calculus. The new course is being taught by Frank DiSalvo this fall and will be taught by Tito Abruña in the spring.

Finally, we will be searching this year for at least one new faculty member. The process of renewing the distinguished cadre of teacher-scholars in this department is an exciting challenge and an opportunity to grow in new areas.

I look forward to the next few years as the department's chair. Because of our traditions of outstanding teaching, superb research, and exceptional collegiality the job should even be fun.

-Jon Clardy

Society of Cornell Chemists Survey
Fall 1988

Please help us maintain an accurate, up-to-date mailing list by returning this survey to:

Kelly Horton, Editorial Assistant
Cornell Chemistry Newsletter
G-57 Baker Laboratory
Cornell University
Ithaca, New York 14853-1301

Name:_____
Last First Middle

Home Address:

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City, State, Zip:_____

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Company:_____

Title:_____

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City, State, Zip:_____

Telephone:_____

I would prefer to have the Newsletter sent to my ___ Home ___ Business address.

Year of Graduation from Cornell (if Alumnus):_____

Degree received:_____

Faculty Advisor in Chemistry:_____

If not an alumnus of Cornell, affiliation with Cornell Chemistry:

_____

Comments about the Newsletter. What would you like to see in future editions?

_____

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If there is any professional or personal news you would like to share with us in a coming Newsletter, or if you have any information regarding our "Lost Alumni" please let us know. Address all information to: Donna Middleton, Editor, Cornell Chemistry Newsletter, Baker Laboratory, Cornell University, Ithaca NY 14853-1301. Please include your name, year of graduation from Cornell (if alumnus), degree, faculty advisor in chemistry, home address, employer, and your business address.

The Society of Cornell Chemists asks you to support the cost of printing and mailing this Newsletter with your voluntary, annual dues of $10. Make your 1988 check payable to "Cornell Chemistry" and mail it to The Society of Cornell Chemists, Baker Laboratory, Department of Chemistry, Cornell University, Ithaca NY 14853-1301.

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